Independent Claim 1.

Preamble:

Recognizes subsequences, represented as Hidden Markov Models (HMM), that are searched for in a given sequence.

We refer to the confidence measures, that are used for the reclassification of the winning hypotheses in Speech Recognition. These are some examples of such measures:

simple normalization	=	accumulated posterior, normalized with the length of the subsequence
double normalization	=	double normalization of the accumulated posterior over the number of phonemes and over the number of acoustic samples in each phoneme.

characterized by: It allows the additional confidence measure, based on the extremes of the values of the logarithm of the accumulated posterior in each phoneme, normalized with its length. We call this measure 'real fitting'.

$$\max_{phoneme \in Visited\ Phonemes} \frac{\sum_{phoneme} -\log(posteriors)}{phoneme\ length}$$

characterized by: It searches the subsequences that offer the maximization of one mentioned confidence measures, over all possible matchings.

characterized by: It allows the revaluation of the alternatives that offer the highest among any mentioned confidence measure on the basis of another confidence measure.

characterized by: It computes the alternative that maximizes the 'simple normalization' by using the method that we have called 'Iterative Viterbi Decoding' and that estimates

the emission probability of the filler states, in an iterative manner, as being equal to the confidence measure in the previous iteration.

characterized by: It computes the alternative that maximizes the 'simple normalization', 'double normalization' or 'real fitting' using an algorithm that considers the emission probability of the filler state as zero. This method computes progressively, for each pair of sample and state of HMM, a set of possible alternatives paths to reach it. The computation of this set is based on the sets of paths that lead to the states that can be associated to the previous sample.

This set can be reduced by using the given appropriate rules for the given confidence measure, ensuring the correctness of the inference.

This set can be also reduced by using heuristics that are based on the aforementioned rules, for speeding up the computation despite the risk of reducing the theoretical quality of the recognition.

Dependent Claim 2.

Preamble:

It is based on the Claim 1.

It estimates the existence of keywords and their position in utterances.

characterized by: It uses the methods described in Claim 1, for recognition of subsequences represented by Hidden Markov Models.

Dependent Claim 3.

Preamble:

It is based on the Claim 1.

It estimates the existence of biomolecular subsequences and their position in the chains of DNA using models like generalized profiles.

characterized by: The estimation of their existence and position is made according to the methods described in the Claim 1, for recognition of subsequences represented by Hidden Markov Models.

Dependent Claim 4.

Preamble:

It is based on the Claim 1. It carries out the estimation of the existence of objects and their position in images.

characterized by: It uses the methods described in Claim 1, for the recognition of subsequences represented by Hidden Markov Models (HMM).

characterized by: Sections through views of virtual objects are modeled by sets of Hidden Markov Models.

characterized by: It uses a probabilistic model based on a distance computed between colors.

characterized by: The Hidden Markov Models that model the objects can be structured of distinct regions, that play in the frame of the method the role of the phonemes.

characterized by: The models of the objects can be modified in a dynamic manner with respect to the transition properties (existence and probability) on the basis of the accumulated information during the fitting process.